# PRACTICE MANAGEMENT

Thomas L. Forbes, MD, Section Editor

From the New England Society for Vascular Surgery

# Assessment of public knowledge about the scope of practice of vascular surgons

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**During the past decade, there has been a sharp increase in the number of vascular procedures performed in the United States. Due to the increase in the size of the aging population, this trend is predicted to continue. Despite this, general public knowledge about vascular surgery appears low. This gap may significantly affect the success of vascular surgery as a specialty. To objectively define knowledge about vascular surgery, we administered a questionnaire to both a sample of the general population and medical students.**

**The Vascular Surgery Knowledge Questionnaire (VSQ), a 58-item multiple choice survey, was designed to assess knowledge about the field of vascular surgery, including types of procedures commonly performed, presenting illnesses, training, and financial compensation. VSQ was tested for reliability and validity. It was administered to a sample of the general population (GP) and first year medical students (MS) via a random digit dial telephone survey and a paper-based survey, respectively. VSQ Score was derived by calculating the percent of questions from the 38-item, non-demographic part of the questionnaire answered correctly and expressed in numerical form. The maximum score possible was 100. Statistical analysis was used to assess differences in VSQ scores.**

**Two hundred GP and 160 MS subjects completed the questionnaire. The mean VSQ score for GP and MS groups was 54 and 67 ($P < .01$), respectively. Forty-one percent of the GP group received a score of less than 50. Only 50% of the GP and 51% of MS cohorts agreed with the statement that vascular surgeons perform procedures on all blood vessels with the exception of the heart and brain. Just 24% of the GP group agreed with the statement that vascular surgeons treat patients with wounds that do not heal. Finally, only half of the GP group agreed that vascular surgeons treat patients with abdominal aortic aneurysms. The GP cohort significantly underestimated the average length of postgraduate training (five years) to become a vascular surgeon. Level of education, income, and residence in the Western states significantly correlated with higher scores. General population subjects who admitted to knowing a vascular surgeon received similar scores to those who did not (58 vs. 53, $P > .05$).**

**These findings support our hypothesis that there is a significant knowledge deficit among both the general population and medical students about the field of vascular surgery. This has protean implications for the future of our specialty and public health in the United States. (J Vasc Surg 2010;51:771-5.)**

In the past decade there has been a sharp increase in the number of vascular procedures performed in the United States.[1] This rise is expected to increase as the baby-boomer generation reaches retirement age.[2] With the advent of minimally invasive techniques to treat vascular disease, there has also been a staggering rise in the number of endovascular procedures performed. Vascular surgeons have taken an active role in adopting these new technologies[1,3] and are in a unique position of being the only specialists who can provide comprehensive medical, surgical, and endovascular treatment to patients with vascular disease.[3,4,5]

Despite this, few people know about what vascular surgeons do. There is a significant knowledge deficit about both vascular disease and the role of the vascular surgeon in treating it.[6] To gain better understanding about this knowledge deficit, we developed a questionnaire to quantitatively assess public knowledge about vascular surgery.

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This survey was then administered both to a sample of the general population (GP) and to medical students (MS).

## METHODS

This study employed a cross-sectional design to assess knowledge of vascular surgery in the United States. In order to objectively define this knowledge, we designed and administered a questionnaire to a sample of GP and MS. The Vascular Surgery Knowledge Questionnaire (VSQ) is a 58-item multiple-choice survey composed of two sections. The first section, consisting of 38 items, was designed to test general understanding of the role of the vascular surgeon in the medical community, including illnesses treated and types of procedures commonly performed, length of training, and financial compensation. Questions 2 and 3, comprised of 13 items, did not relate to vascular surgery directly: These questions evaluated knowledge of other fields and were not used further. The second section, comprised of eight items, queried demographic information (Appendix, online only).

The survey was distributed in September 2004 to 360 subjects in two separate cohorts: The GP cohort consisted of 200 participants randomly selected from the general population to complete the VSQ. The VSQ was administered via telephone by California Survey Research Services, Inc. (CSRS, Van Nuys, Calif), who purchased a nationwide random digit dial sample file of sufficient size to complete the required 200 interviews. A maximum of four call attempts was made to each sample number at different days and different times in order to reach eligible respondents. Callback appointments, when necessary, were arranged at the convenience of the respondents. The net effective incidence for this study was 95% ± 5% and interviews were conducted in English. Participants were 18 years of age or older and included individuals with a range of exposure to the healthcare field. Physicians were specifically excluded.

One hundred and sixty first year medical students at State University of New York (SUNY) Upstate Medical University at Syracuse and Texas Tech Medical University in Lubbock were given the VSQ. Administration of the questionnaires was approved by the Dean's office and local Institutional Review Boards (IRB). Each individual anonymously completed the VSQ on paper and returned their questionnaire to the class president. One hundred and twenty two surveys were completed at SUNY Upstate Medical University and 38 surveys were completed at Texas Tech Medical University. Surveys from both medical schools were combined for analysis.

VSQ Score was derived by calculating the percent of questions from the 38-item, non-demographic part of the questionnaire answered correctly. The score was expressed in numerical form. The maximum score possible was 100. Years of training and average yearly compensation were noted separately.

The validity of the questionnaire was established through multiple reviews by the authors. Upon completion of these reviews, twelve attending vascular surgeons at Cedars Sinai Medical Center (Los Angeles, Calif) were administered the questionnaire. The average VSQ score of this cohort was 96 with a range of 92 to 100, suggesting that this questionnaire would adequately and accurately predict vascular surgical knowledge.

Initial calculations suggested that a sample size of at least 100 in each group had an 80% power to detect a difference between means of four units with a significance level (alpha) of 0.05. A reliability analysis was performed to determine the reproducibility of results obtained from the questionnaire. For internal consistency, the Cronbach's alpha coefficient for the VSQ in this sample of subjects was 0.8.

All analyses were done using S-Plus (version 3.1, Statistical Sciences, Inc., Seattle, Wash). Student's independent *t* test was used to determine if there was a difference in mean survey score for the a priori and post hoc groupings. A test of variances was conducted in conjunction. Equal variance refers to the pooled *t* test and unequal variance to the Welch test, which is appropriate if the two variances are not equal. The *t* value used was based on the test of variance proving significant. A similar analysis was done using the one-way analysis of variance to compare the mean score for each study group (greater than two groups) with the test statistics based on the type III sum of squares. If a statistically significant difference in the model was found, then a Tukey's Honestly Significant Difference (HSD) was used to determine which groups differed. Descriptive statistics for dichotomous and categorical data included number of observations and percentages. The Pearson's chi-square test was used for dichotomous outcomes to test for associations in the data for post-hoc groupings. Unless otherwise noted, significance was assumed when the two-tailed *P* value was less than 0.05.

## RESULTS

Two hundred GP and 160 MS subjects completed the questionnaire. The age distribution of the GP group was even, with no age range dominating (Table I). As expected, the MS group was predominately in the 18-24 year age range (71%). The majority of subjects (80% GP, 73% MS groups) reported their race as Caucasian. Forty-two percent of GP reported their income in the $25,001 to $74,999 range. Sixty-four percent of all questionnaire respondents were male (70% GP, 57% MS groups). Ninety-two percent of GP completed at least high school, 39% finished or currently attended college, and 16% had graduate school experience. Nine percent of GP had seen a vascular surgeon as a patient and 20% of the GP cohort knew one personally or professionally. Among MS, 11% were acquainted with a vascular surgeon.

The mean VSQ score for the GP and MS groups was 54 and 67 ($P < .01$), respectively (Table II). The GP cohort significantly underestimated the average length of postgraduate training (five years) to become a vascular surgeon in 2004. The MS group was closer to being correct at assessing length of training at six years ($P < .01$). Medical students predicted a higher annual salary for vascular surgeons compared with the GP cohort ($272,718 versus

**Table I.** Demographic statistics

| | *Total sample* | *General population* | *Medical students* |
|---|---|---|---|
| Age | | | |
| 18-24 | 136 (38) | 22 (11) | 114 (71) |
| 25-34 | 76 (21) | 36 (18) | 40 (25) |
| 35-44 | 34 (9) | 31 (16) | 3 (2) |
| 45-54 | 48 (13) | 48 (24) | 0 (0) |
| 55-64 | 20 (6) | 20 (10) | 0 (0) |
| 65 and up | 43 (12) | 43 (22) | 0 (0) |
| Race | | | |
| Caucasian | 277 (77) | 160 (80) | 117 (73) |
| African American | 25 (7) | 21 (11) | 4 (3) |
| Hispanic | 9 (3) | 5 (3) | 4 (3) |
| Asian | 31(9) | 6 (3) | 25 (16) |
| Other | 6 (2) | 3 (2) | 3 (2) |
| No response | 12 (3) | 5 (3) | 7 (4) |
| Income | | | |
| Less than $25,000 | 140 (39) | 52 (26) | 88 (55) |
| $25,001 to $74,999 | 119 (33) | 84 (42) | 35 (22) |
| Greater than $75,000 | 56 (16) | 38 (19) | 18 (11) |
| No response | 44 (12) | 25 (13) | 19 (12) |
| Gender | | | |
| Male | 230 (64) | 139 (70) | 91 (57) |
| Female | 130 (36) | 61 (30) | 69 (43) |
| Education | | | |
| Less than high school | 16 (4) | 16 (8) | 0 (0) |
| Completed high school | 75 (21) | 75 (38) | 0 (0) |
| Finished/currently attending college | 77 (21) | 77 (39) | 0 (0) |
| Finished/currently attending graduate school | 192 (53) | 32 (16) | 160 (100) |
| Know vascular surgeon | | | |
| Yes | 56 (16) | 39 (20) | 17 (11) |
| No | 304 (84) | 161 (80) | 143 (89) |
| Seen vascular surgeon | | | |
| Yes | 17 (5) | 17 (9) | 0 (0) |
| No | 343 (95) | 183 (91) | 160 (100) |

N = 360.
Data are given in number (%).

**Table II.** Comparison of the total sample

| | *VSQ score* | *Years of training* | *Average salary ($ US)* |
|---|---|---|---|
| Group | | | |
| General public | 54.0 (1.0) | 5.2 (0.2) | 188,442 (9,322) |
| Medical student | 67.2 (1.2)* | 6.1 (0.2)* | 272,718 (10,234)* |

N = 360.
Data are given in mean (SE).
*$P$ values less than 0.01.

$188,442, $P < .01$). Forty-one percent of the GP group received a score of less than 50 on the VSQ (Table III).

Among the GP, those older than 45 years did not obtain higher VSQ scores than those younger than 45 years (Table IV). Respondents from the Western United States had significantly higher VSQ scores than those from the East, Midwest, and South ($P < .01$). A statistically significant linear trend in VSQ score existed in the GP cohort

**Table III.** Comparison of the total sample (VSQ Score categorized)

| | *Group* | |
|---|---|---|
| | *General public* | *Medical students* |
| Vascular total score* | | |
| <50 | 82 (41) | 16 (10) |
| >50 | 118 (59) | 144 (90) |

N = 360.
Data are given in number (%).
Pearson's chi-square test.
*$P$ value less than 0.01.

when considering respondent's yearly income, with an increasing score seen incrementally with higher incomes ($P < .01$). There was no difference in VSQ scores between male and female respondents, although the latter group guessed the average salary for the vascular surgeon to be lower ($P < .01$). A significant linear trend in VSQ score existed based on the education level of the subjects, with a higher scores obtained by those with more education ($P < .01$). Furthermore, when VSQ score was compared by education dichotomized as having high school education or less versus a college education or more, a significant mean difference was found (49 vs 58, respectively; $P < .01$). General population subjects who admitted to knowing a vascular surgeon personally or had seen one as a patient received similar scores to those who did not (57 vs 53; $P$ = NS).

Evaluation of the MS cohort demonstrated no difference in VSQ scores when compared by medical school, age, and gender (Table V). Of interest, those medical students who reported to know a vascular surgeon scored significantly higher than those that did not know one (79 vs 65, respectively; $P < .01$).

Evaluation of answers to specific questions on the survey deserve mention. Only 50% of GP agreed with the statement that vascular surgeons intervene on all vessels except for those in the heart and brain (Appendix, question 1C, online only). Fifty-nine percent of MS agreed with the statement that vascular surgeons perform minimally invasive endovascular procedures (Appendix, question 1E, online only). Only 24% of GP and 41% of MS agreed with the statement that vascular surgeons take care of patients with poorly healing wounds (Appendix, question 4A, online only). Forty-one percent of GP and 36% of the MS agreed with the statement that vascular surgeons treat brain aneurysms (Appendix, question 4K, online only). Finally, only 51% of GP agreed with the statement that a vascular surgeon would treat a patient with an abdominal aortic aneurysm (Appendix, question 4L, online only).

## DISCUSSION

Vascular surgeons, as a specialty, have embraced the rapid changes that are affecting the diagnosis and treatment of peripheral vascular disease and have readily adopted minimally invasive endovascular therapies into their arma-

**Table IV.** Comparison of the general population group

| | *VSQ score* | *Years of training* | *Average salary ($ US)* |
|---|---|---|---|
| Age | | | |
| Less than 45 | 53.5 (1.4) | 5.2 (0.3) | 166,304 (15,363) |
| Over 45 | 54.4 (1.3) | 5.3 (0.3) | 207,108 (14,107) |
| Region | | | |
| East | 55.3 (1.8) | 4.9 (0.3) | 176,050 (19,649) |
| South | 49.4 (1.6) | 5.5 (0.4) | 190,807 (18,947) |
| Midwest | 55.0 (1.9) | 5.4 (0.4) | 171,133 (20,436) |
| West | 59.5 (2.4)* | 5.3 (0.5) | 235,690 (26,563) |
| Income | | | |
| Less than $25,000 | 48.6 (1.8) | 5.8 (0.4) | 142,283 (20,674) |
| $25,001 to $74,999 | 55.4 (1.4) | 5.0 (0.3) | 182,635 (15,580) |
| Greater than $75,000 | 57.2 (2.1)* | 4.8 (0.4) | 246,517 (22,746)* |
| Gender | | | |
| Male | 52.4 (1.7) | 5.1 (0.4) | 214,395 (19,099) |
| Female | 54.7 (1.1) | 5.3 (0.2) | 177,462 (12,440)* |
| Education | | | |
| Less than high school | 45.2 (3.2) | 5.9 (0.7) | 170,429 (37,842) |
| Completed high school | 50.0 (1.5) | 5.6 (0.3) | 169,176 (17,298) |
| Finished/currently attending college | 57.6 (1.5) | 4.9 (0.3) | 181,682 (16,350) |
| Finished/currently attending graduate school | 59.3 (2.3)* | 5.0 (0.5) | 252,500 (25,030)[1] |
| Education | | | |
| High school or less | 49.1 (1.3) | 5.6 (0.3) | 169,395 (15,885) |
| College or more | 58.1 (1.2)* | 4.9 (0.3) | 202,861 (13,821) |
| Seen/know vascular surgeon | | | |
| Yes | 56.8 (2.0) | 5.3 (0.4) | 213,171 (22,384) |
| No | 53.2 (1.1) | 5.2 (0.2) | 181,545 (11,821) |
| Know vascular surgeon | | | |
| Yes | 57.5 (2.1) | 5.4 (0.4) | 215,946 (23,554) |
| No | 53.1 (1.1) | 5.2 (0.2) | 181,703 (11,660) |
| Seen vascular surgeon | | | |
| Yes | 54.6 (3.3) | 5.4 (0.7) | 174,375 (35,966) |
| No | 53.9 (1.0) | 5.2 (0.2) | 189,751 (10,969) |

N = 200.
Data are given in mean (SE).
*$P$ value less than 0.01.
[1]$P$ value less than 0.05.

mentarium.[5] They are in a distinct position among other vascular specialists in that they are able to treat patients with peripheral vascular disease using medical, endovascular, and open surgical modalities. Despite this, there exists a significant knowledge deficit about both vascular disease[6] and the role of the vascular surgeon in treating it. We hypothesized that this knowledge deficit is wide and far reaching. Potentially, it has a significant effect on how we are viewed by the general public, the media, regulatory agencies, our medical colleagues, and, finally, by future vascular fellows. To assess this knowledge deficit, we developed the VSQ, validated it, and administered it to a sample of the GP and first year MS.

There is evidence that awareness of peripheral vascular disease among the general population is low,[6,7,8] and this fact has prompted a number of efforts to increase public education through public awareness programs.[9] Despite the reality that vascular surgeons play an important role in treating patients with vascular disease, there are few if any available published data to address public knowledge of this fact. Given the changes that are occurring in health care in the United States, our assessment was needed and is timely.

The GP cohort performed poorly on the survey as assessed by the VSQ score. Whereas vascular surgeons who validated this questionnaire had a mean VSQ score of 96, GP mean score was only 54. In fact, 41% of respondents received a score of less than 50, which translates to getting more than half of the questions wrong. The GP cohort underestimated the number of years it took to become a vascular surgeon in 2004. Not surprisingly, education and income levels correlated with higher scores. Of interest, those people who claimed to know a vascular surgeon scored no better than those who didn't.

Medical students performed better than the GP group. Despite higher VSQ scores, there is significant room for improvement. Those medical students who knew a vascular surgeon received a mean VSQ score of 79.5, which is the highest score received by any subgroup other than vascular surgeons who validated the questionnaire. This suggests that exposure of medical students to a vascular surgeon may significantly increase their knowledge about the field of vascular surgery. It is possible that this knowledge may translate into interest in the field.

**Table V.** Comparison of the medical student group

| | *VSQ score* | *Years of training* | *Average salary ($ US)* |
|---|---|---|---|
| Medical school | | | |
| Syracuse | 66.2 (1.1) | 6.1 (0.1) | 262,576 (9,628) |
| Texas Tech | 70.1 (2.0) | 6.3 (0.2) | 304,211 (16,966)[1] |
| Age | | | |
| 18-24 | 66.4 (1.1) | 6.1 (0.1) | 269,779 (9,973) |
| Greater than 25 | 69.3 (1.8) | 6.3 (0.2) | 280,442 (16,167) |
| Gender | | | |
| Male | 68.7 (1.3) | 6.1 (0.1) | 274,764 (11,246) |
| Female | 65.1 (1.5) | 6.1 (0.2) | 270,000 (12,961) |
| Know vascular surgeon | | | |
| Yes | 79.5 (2.8) | 6.2 (0.3) | 316,176 (25,469) |
| No | 65.7 (1.0)* | 6.1 (0.1) | 267,403 (8,907) |

N = 160.
Data are given in mean (SE).
*$P$ value less than 0.01.
[1]$P$ value less than 0.05.

Medical students have been queried before in regards to the choice of general surgery[10,11] or vascular surgery[12] as a future field: These studies, unlike our study, however, did not focus on knowledge of the role and practice of the vascular surgeon.

Questionnaires are increasingly used today to assess knowledge across many populations.[11,13] Although published literature contains much information on questionnaire design in general, little information is available on the challenges related to questionnaires applied to the medical specialty of vascular surgery.[12] Although we designed and administered such a survey, there are a number of weaknesses of our study that deserve mention. Our survey has not been validated by others. It is difficult to quantify the significance of the VSQ score; therefore interpretation of the meaning of absolute scores is difficult. Lastly, only a portion of the first year MS class at each institution completed the questionnaire, and therefore a selection bias is possible. Despite these weaknesses, important information can be gleaned from our data.

Our findings support the hypothesis that there is a significant knowledge deficit among both the general population and medical students about the field of vascular surgery. This has protean implications for the future of our specialty and public health in the United States. Vascular surgeons need to play an active role in educating the public about both peripheral vascular disease and our role in managing it. Increased awareness by the general public will translate to increased visibility of our specialty in front of policy makers and will ensure a secure place for vascular surgery as a specialty as we prepare for health care reform. Vascular surgeons also need to actively increase exposure of medical students to our specialty. This will increase interest in vascular surgery among medical students and counteract the decline in the quality of applicants to vascular fellowship.[14]

## AUTHOR CONTRIBUTIONS

Conception and design: AF, CS
Analysis and interpretation: AF, BL, SL, TB
Data collection: BL, TB, SL
Writing the article: AF, CS
Critical revision of the article: AF, BL, CS, SL, TB
Final approval of the article: AF, BL, CS, SL, TB
Statistical analysis: BL
Obtained funding: AF
Overall responsibility: AF

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*Additional material for this article may be found online at www.jvascsurg.org.*

**Appendix (online only). Vascular Surgery Knowledge Questionnaire**

The following survey contains questions about vascular surgeons and the field of vascular surgery. It is preferable that you answer all the questions to the best of your ability. Please be aware that it is okay to select "don't know" to a particular question. Please circle your answer.

1. Which of the following do you think a **vascular surgeon** would perform:

| | | *YES* | *NO* | *DON'T KNOW* |
|---|---|---|---|---|
| a. | Operations/procedures on the heart | 1 | 2 | 9 |
| b. | Operations/procedures on veins | 1 | 2 | 9 |
| c. | Operations/procedures on all blood vessels excluding the heart and brain | 1 | 2 | 9 |
| d. | Operations/procedures on blood vessels in the brain | 1 | 2 | 9 |
| e. | Minimally invasive/endovascular procedures (angioplasty, stenting) | 1 | 2 | 9 |

2. Do you think a **cardiologist** would primarily treat individuals who have the following medical problems?

| | | *YES* | *NO* | *DON'T KNOW* |
|---|---|---|---|---|
| a. | Heart attack | 1 | 2 | 9 |
| b. | Chest pain | 1 | 2 | 9 |
| c. | Fracture of major bones | 1 | 2 | 9 |
| d. | Skin cancer | 1 | 2 | 9 |
| e. | Stroke due to blocked carotid arteries | 1 | 2 | 9 |
| f. | Arthritis | 1 | 2 | 9 |
| g. | Blocked coronary artery in need of a coronary artery bypass | 1 | 2 | 9 |

3. Do you think a **dermatologist** would primarily treat individuals who have the following medical problems?

| | | *YES* | *NO* | *DON'T KNOW* |
|---|---|---|---|---|
| a. | Acne and cysts | 1 | 2 | 9 |
| b. | Sexually transmitted diseases | 1 | 2 | 9 |
| c. | Dermatitis | 1 | 2 | 9 |
| d. | Warts | 1 | 2 | 9 |
| e. | Arthritis | 1 | 2 | 9 |
| f. | Hearing loss | 1 | 2 | 9 |

4. Do you think a **vascular surgeon** would primarily treat individuals who have the following medical problems?

| | | *YES* | *NO* | *DON'T KNOW* |
|---|---|---|---|---|
| a. | Wounds that do not heal | 1 | 2 | 9 |
| b. | Kidney stones | 1 | 2 | 9 |
| c. | Unsightly varicose veins | 1 | 2 | 9 |
| d. | Kidney failure in need of dialysis | 1 | 2 | 9 |
| e. | Appendicitis in need of surgical treatment | 1 | 2 | 9 |
| f. | Heart attack | 1 | 2 | 9 |
| g. | Heart attack, in need of coronary artery bypass graft | 1 | 2 | 9 |
| h. | Heart attack, in need of coronary balloon angioplasty | 1 | 2 | 9 |
| i. | Leg pain after walking due to blocked leg arteries | 1 | 2 | 9 |
| j. | Poor circulation to the legs, in need of balloon angioplasty | 1 | 2 | 9 |
| k. | Brain aneurysms | 1 | 2 | 9 |
| l. | Abdominal aortic aneurysms | 1 | 2 | 9 |

5. Do you believe the following statement describes a **vascular surgeon's** role in treating patients. He or she . . .?

| | | *YES* | *NO* | *DON'T KNOW* |
|---|---|---|---|---|
| a. | Spends the majority of his/her time in the emergency room treating acute trauma | 1 | 2 | 9 |
| b. | In some cases acts as primary treating physician who provides non-surgical care for patients with vascular disease | 1 | 2 | 9 |
| c. | Often performs electively scheduled operations | 1 | 2 | 9 |
| d. | Places stents in arteries | 1 | 2 | 9 |
| e. | Spends the majority of his/her time treating varicose veins | 1 | 2 | 9 |
| f. | Performs procedures to prevent stroke | 1 | 2 | 9 |

**Appendix (online only). Continued.**

| | | *YES* | *NO* | *DON'T KNOW* |
|---|---|---|---|---|
| g. | Performs operations/procedures to prevent heart attack | 1 | 2 | 9 |
| h. | Is often (more than 4 days a week) called into the hospital in the middle of the night to perform surgery | 1 | 2 | 9 |
| i. | Performs procedures to prevent amputations | 1 | 2 | 9 |

6. What do you believe is the average number of years of clinical training **after medical school** needed to become a vascular surgeon? Please write your answer on the line provided.

_____ YEARS

7. Do you think that the average number of years of clinical training after medical school to become a **vascular surgeon** would be less than, the same as, or more than the number of years of training to become a . . .?

| | | *LESS THAN* | *SAME AS* | *MORE THAN* | *DON'T KNOW* |
|---|---|---|---|---|---|
| a. | Family practitioner | 1 | 2 | 3 | 9 |
| b. | Neurosurgeon (brain surgeon) | 1 | 2 | 3 | 9 |
| c. | General surgeon | 1 | 2 | 3 | 9 |
| d. | Dermatologist | 1 | 2 | 3 | 9 |
| e. | Radiologist | 1 | 2 | 3 | 9 |
| f. | Cardiologist | 1 | 2 | 3 | 9 |

8. Do you think that the average number of years of training **after high school** devoted to formal training to become a **vascular surgeon** would be less than, the same as, or more than the number of years of training to become . . .?

| | | *LESS THAN* | *SAME AS* | *MORE THAN* | *DON'T KNOW* |
|---|---|---|---|---|---|
| a. | An assistant professor of Biology at a major university | 1 | 2 | 3 | 9 |
| b. | A lawyer in a large law firm | 1 | 2 | 3 | 9 |
| c. | A plumber | 1 | 2 | 3 | 9 |
| d. | An investment banker in New York City | 1 | 2 | 3 | 9 |
| e. | An FBI agent | 1 | 2 | 3 | 9 |

9. What do you think is the approximate average yearly income of a **vascular surgeon**? Please write your answer on the line provided.

$_____ YEARLY INCOME

**The following is to be used for statistical purposes only.**

**The following questions require a written answer. Please write your answer on the line provided.**

10. What is your state of residence: _____

11. What year of medical school are you in: _____ (*Only for Medical Students)*

**The following questions require you to select an answer. Mark an X on the line that corresponds to your answer**.

12. Which of the following categories includes your age:

1 ____ 18-24
2 ____ 25-34
3 ____ 35-44
4 ____ 45-54
5 ____ 55-64
6 ____ 65 and over
9 ____ REFUSE

13. What is your gender:

1 ____ MALE 2 ____ FEMALE

14. Which of the following includes your race/ethnicity.

1 ____ White/Caucasian
2 ____ Black/African American
3 ____ Asian/Pacific Islander
4 _____ Hispanic/Latino

**Appendix (online only). Continued.**

5 ____ Other: (specify) _____
9 ____ REFUSE

15. Which category includes your total household annual income before taxes?

1 ____ Less than $25,000
2 ____ $25,000 to less than $75,000
3 ____ $75,000 or more
9 ____ REFUSE

16. Do you know a vascular surgeon personally or professionally?

1 ____ YES
2 ____ NO
9 ____ REFUSE

17. Have you ever seen a vascular surgeon as a patient?

1 ____ YES
2 ____ NO
9 ____ REFUSE



**Answers**
**1a. 2**
**1b. 1**
**1c. 1**
**1d. 2**
**1e. 1**
**2a. 1**
**2b. 1**
**2c. 2**
**2d. 2**
**2e. 1**
**2f. 2**
**2g. 2**
**3a. 1**
**3b. 1**
**3c. 1**
**3d. 1**
**3e. 2**
**3f. 2**
**4a. 1**
**4b. 2**
**4c. 1**
**4d. 1**
**4e. 2**
**4f. 2**
**4g. 2**
**4h. 2**
**4i. 1**
**4j. 1**
**4k. 2**
**4l. 1**
**5a. 2**
**5b. 1**
**5c. 1**
**5d. 1**
**5e. 2**

**Appendix (online only). Continued.**

**5f. 1**
**5g. 2**
**5h. 2**
**5i. 1**
**6. 6-9 years**
**7a. 3**
**7b. 2**
**7c. 3**
**7d. 3**
**7e. 3**
**7f. 3**
**8a. 3**
**8b. 3**
**8c. 3**
**8d. 3**
**8e. 3**
**9. $250,000-350,000**